

Worksheet 4.2: Properties from Algebra

Identify the algebraic property illustrated below.

1. If $x - 2 = 4$, then $x - 2 + 2 = 4 + 2$ _____

2. If $3x = 12$, then $\frac{3x}{3} = \frac{12}{3}$ _____

3. $2(x + 3) = 2x + 6$ _____

4. If $7 = \frac{1}{2}x - 3$, then $\frac{1}{2}x - 3 = 7$ _____

5. If $y = 2x + 3$ and $y = x - 7$, then
 $2x + 3 = x - 7$ _____

6. If $5x + 4 = 14$, then $5x + 4 - 4 = 14 - 4$ _____

7. If $2x + 3y = 15$ and $y = x + 2$, then
 $2x + 3(x + 2) = 15$ _____

8. If $y = x + 2$, then $x + 2 = y$ _____

9. $3 = 3$ _____

10. $(x + 2) + 3 = x + (2 + 3)$ _____

11. $2 \cdot \frac{1}{2} = 1$ _____

12. $3 + 0 = 3$ _____

13. $4 + (-4) = 0$ _____

14. $7 \cdot 1 = 7$ _____

15. Fill in the blank with the property that justifies each step in the "proof" below.

Given: $2(x + 3) = 18$

Prove: $x = 6$

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|----------------------------------|----------|
| 1. $2(x + 3) = 18$ | 1. Given |
| 2. $2x + 2 \cdot 3 = 18$ | 2. _____ |
| 3. $2x + 6 = 18$ | 3. _____ |
| 4. $2x + 6 - 6 = 18 - 6$ | 4. _____ |
| 5. $2x = 12$ | 5. _____ |
| 6. $\frac{2x}{2} = \frac{12}{2}$ | 6. _____ |
| 7. $x = 6$ | 7. _____ |

16. Write a proof similar to the one above showing that if $\frac{1}{2}(6x + 8) = 16$, then $x = 4$.